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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,084

05/25/2007

Keisuke Matsui

47236-0007-00-US

1575

55694 7590 12/28/2009
DRINKER BIDDLE & REATH (DC)
1500 K STREET, N.W.
SUITE 1100
WASHINGTON, DC 20005-1209

EXAMINER

O HARA, EILEEN B

ART UNIT

PAPER NUMBER

1638

MAIL DATE

DELIVERY MODE

12/28/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/583,084	Applicant(s) MATSUI ET AL.	
	Examiner EILEEN B. O HARA	Art Unit 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>6/15/06, 4/18/07, 5/25/07</u> . | 6) <input type="checkbox"/> Other: ____. |

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DETAILED ACTION

Status of Claims

Claims 1-22 are pending in the instant application and under examination.

Information Disclosure Statement

The information disclosure statements (IDS) submitted on June 15, 2006, April 18, 2007 and May 25, 2007 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Specification

The disclosure is objected to because of the following informalities: on page 5, third line from the bottom, "legating" should be spelled "ligating".

The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code (see page 40, for example). Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

Appropriate correction is required.

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Claim Objections

Claim 14 is objected to because of the following informalities: claim 14 recites “The arachidonic acid-containing plant as set forth in claim 1, wherein the arachidonic acid producing step includes an expression suppressing step of suppressing expression of a A15 desaturase in *a host*.”

The last part of the claim should recite “in *the plant*”, since as written the suppression can be in another host, and not the plant of claim 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 is indefinite because it recites "wherein, in the expression suppressing step", and is dependent from claim1, but there is no expression suppressing step in claim 1. The examiner believes that Applicants intend claim 15 to depend from claim 14.

Claim 16 is indefinite because it recites "or offspring of a plant individual having the *same trait* as the grown plant individual", and is dependent from claim1, but it is not clear which “same trait” is meant. It is suggested that “offspring of a plant individual having the same trait”

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is replaced by “offspring of a plant individual that contains arachidonic acid” or a similar amendment to clarify that the same trait is producing arachidonic acid.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 5-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Mukerji et al, WO 99/64616, December 16, 1999, cited in IDS filed June 15, 2006.

Claims 1-3 and 5-22 are drawn to an arachidonic-containing plant produced by a process that comprises an arachidonic acid producing step in which fatty acid synthetase genes associated with the biosynthesis of arachidonic acid are introduced into a plant to produce arachidonic acid, wherein the arachidonic acid producing step includes a transforming step in which a recombinant expression vector contains genes encoding the fatty acid synthetases associated with the biosynthesis of arachidonic acid are introduced into a plant cell, wherein the arachidonic acid producing step further includes a recombinant expression vector constructing step of constructing a recombinant expression vector, wherein the fatty acid synthetases associated with the biosynthesis of arachidonic acid are $\Delta 6$ desaturase, fatty-acid-chain elongase, and $\Delta 5$ desaturase, wherein the $\Delta 6$ desaturase is one of:

(a) a protein consisting of an amino acid sequence of SEQ ID NO: 1; and

(b) a protein, consisting of an amino acid sequence that has been modified by substitution,

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deletion, insertion, and/or addition of one or more amino acids of SEQ ID NO: 1, for catalyzing a reaction of introducing an unsaturated bond at position $\Delta 6$ of an aliphatic monocarboxylic acid, wherein the gene encoding the $\Delta 6$ desaturase is one of:

(c) a gene having a base sequence of SEQ ID NO: 2 as an open reading frame; and (d) a gene that hybridizes under stringent conditions with a gene of a base sequence complementary to a base sequence of a gene identified by SEQ ID NO: 2, and that encodes a protein which catalyzes a reaction of introducing an unsaturated bond at position $\Delta 6$ of an aliphatic monocarboxylic acid, Wherein the fatty-acid-chain elongase is one of:

(e) a protein consisting of an amino acid sequence of SEQ ID NO: 3; and consisting of an amino acid sequence that has been modified by substitution, deletion, insertion, and/or addition of one or more amino acids of SEQ ID NO: 3, for catalyzing a reaction of elongating a carbon chain of an aliphatic monocarboxylic acid.

(Original) The arachidonic acid-containing plant as set forth in claim 5, wherein the gene encoding the fatty-acid-chain elongase is one of:

(g) a gene having a base sequence of SEQ ID NO: 4 as an open reading frame; and (h) a gene that hybridizes under stringent conditions with a gene of a base sequence complementary to a base sequence of a gene identified by SEQ ID NO: 4, and that encodes a protein which catalyzes a reaction of elongating a carbon chain an aliphatic monocarboxylic acid, wherein the $\Delta 5$ desaturase is one of:

(i) a protein consisting of an amino acid sequence of SEQ ID NO: 5; and

(j) a protein, consisting of an amino acid sequence that has been modified by substitution, deletion, insertion, and/or addition of one or more amino acids of SEQ ID NO: 5, for catalyzing a

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reaction of introducing an unsaturated bond at position $\Delta 5$ of an aliphatic monocarboxylic acid, wherein the gene encoding the $\Delta 5$ desaturase is one of:

(k) a gene having a base sequence of SEQ ID NO: 6 as an open reading frame; and

(l) a gene that hybridizes under stringent conditions with a gene of a base sequence complementary to a base sequence of a gene identified by SEQ ID NO: 6, and that encodes a protein which catalyzes a reaction of introducing an unsaturated bond at position $\Delta 5$ of an aliphatic monocarboxylic acid, wherein the fatty acid synthetases associated with the biosynthesis of arachidonic acid, or the genes encoding the fatty acid synthetases are derived from *Mortierella alpine*, wherein the arachidonic acid producing step includes an expression suppressing step of suppressing expression of a $\Delta 5$ desaturase in a host by and RNAi method, wherein the plant comprises a plant cell, a plant tissue, a plant callus, a plant seed, a grown plant individual, or offspring of a plant individual having the same trait as the grown plant individual, wherein the plant comprises a soybean, arachidonic acid obtained from the arachidonic acid-containing plant, composition which comprises the arachidonic acid of claim 18, a food which comprises the arachidonic acid composition, arachidonic acid-containing plant preparation kit for preparing the arachidonic acid-containing plant comprising a recombinant expression vector including a promoter and genes encoding fatty acid synthetases associated with the biosynthesis of arachidonic acid, and further comprising a set of reagents for introducing the recombinant expression vector into a plant cell.

Mukerji et al teach making arachidonic-containing plants by transforming plants with genes from *Mortierella alpine*, wherein the genes are present in recombinant expression vectors

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comprising promoters and other regulatory elements, the genes are $\Delta 5$ desaturase, fatty-acid-chain elongase and $\Delta 6$ desaturase, using DNA expression constructs (abstract, page 2, 4, 5, 7, 8, 10, 12). These genes are operably linked to DNA encoding the genes (page 14), and promoter that may be a seed-specific promoter (pages 8 and 26).

Mukerji et al teach that the PUFAs produced and compositions comprising the arachidonic acids may be extracted (page 17-18), and that arachidonic acid and other PUFAs are important food sources (page 3). Also taught is that additional nucleic acid sequences may be transformed into the plants to improve arachidonic acid production, such as sequences that inhibit $\Delta 15$ desaturase expression, such as antisense constructs (page 8). Plant parts are also taught and offspring of the transformed plants that produce arachidonic acid (page 5).

Therefore Mukerji et al anticipates the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mukerji et al, WO 99/64616, December 16, 1999, and further in view of Lerchl et al., U.S. Patent No. 7179647, filing date January 13, 2003.

Claim 4 is drawn to an arachidonic-containing plant produced by a process that comprises an arachidonic acid producing step in which fatty acid synthetase genes associated with the biosynthesis of arachidonic acid are introduced into a plant to produce arachidonic acid, wherein the arachidonic acid producing step includes a transforming step in which a recombinant expression vector contains genes encoding the fatty acid synthetases associated with the biosynthesis of arachidonic acid are introduced into a plant cell, wherein the recombinant expression vector constructing step includes a step in which the genes encoding the fatty acid synthetases associated with the biosynthesis of arachidonic acid are ligated downstream of a soybean seed-specific promoter.

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The teachings of Mukerji et al are discussed above. Mukerji et al teaches that the promoter may be a seed-specific promoter (pages 8 and 26), but do not teach that the promoter may be a soybean promoter.

Lerchl et al. teach at paragraph (25):

“Mosses and algae are the only known plant systems which produce considerable amounts of polyunsaturated fatty acids such as arachidonic acid (ARA) and/or eicosapentaenoic acid (EPA) and/or docosahexaenoic acid (DHA). Fungal systems too, such as Oomycetes (Eukaryota/Stramenopiles/Oomycetes/Phythiales/Pythiaceae) produce the abovementioned fatty acids. This is why nucleic acid molecules which originate from a Oomycete such as *Phytophthora infestans* are particularly suitable for modifying the lipid and PUFA production system in a host, in particular in microorganisms such as the abovementioned microorganisms, and in plants such as oil crops, for example oilseed rape, canola, linseed, soybeans, sunflowers, borage. Furthermore, nucleic acids from a Oomycete such as *Phytophthora infestans* can be used for identifying such DNA sequences and enzymes in other species which are suitable for modifying the biosynthesis of PUFA precursor molecules in the organisms in question.”

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention, to make a transgenic soybean comprising fatty acid synthetase genes from *Mortierella alpine* that could produce arachidonic acid in soybeans using a soybean seed-specific promoter, since Mukerji et al teach that such genes can be transformed into plants and under the control of seed-specific promoters to produce large quantities in seeds, and to transform soybeans, as taught by Lerchl et al, who teach that soybeans are a preferable crop to do so in.

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Finally, the Supreme Court has determined, in *KSR International Co. v. Teleflex, Inc.*, 550 U.S. __, 82, USPQ2d 1385 (2007), that “.....[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results” (KSR, 550 U.S. at __, 82 USPQ2d at 1395). The court further found that “..... the conclusion that when a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious” (KSR, 550 U.S. at __, 82 USPQ2d at 1395-1396). Further, the Supreme Court has determined that “a person of ordinary skill attempting to solve a problem will” not “be led only to those elements of prior art designed to solve the same problem.....” (KSR, 550 U.S. at __, 82 USPQ2d at 1397). In addition, the court found that “When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variant, 35 USC 103 likely bars its patentability” (KSR, 550 U.S. at __, 82 USPQ2d at 1396). Further the court found that the Federal Circuit has erred in applying the teaching-suggestion-motivation test in an overly rigid and formalistic way, in particular by concluding “that a patent claim cannot be proved obvious merely by showing that the combination of elements was ‘obvious to try’” (KSR, 550 U.S. at __, 82 USPQ2d at 1397) and has further determined that “.....[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results” (KSR, 550 U.S. at __, 82 USPQ2d at 1395). Thus, when considering obviousness of a combination of known elements, the operative question is “whether the improvement is more than the predictable use of

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prior art elements according to their established functions” ((KSR, 550 U.S. at __, 82 USPQ2d at 1396).

Given the above, applying the same logic to the instant process claims, it would have been *prima facie* obvious to modify the method of Mukerji et al to produce the instantly claimed method because Mukerji et al specifically recognized the problem or need in the art to solve the problem of making transgenic plants that would produce arachidonic acid. Further, given the known problem to be solved, given the known conventional and successful techniques for solving the problem, transformation of soybeans would have been obvious. The success of the solution would be a product of ordinary skill and common sense but not the product of innovation.

Pertinent Art

The art pertinent to the instant application follows:

$\Delta 6$ desaturase from *Mortierella alpina* in U.S. Patent No. 5968809 is 99% identical to SEQ ID NO: 1 of the instant application.

```
RESULT 2
US-08-834-655-2
; Sequence 2, Application US/08834655
; Patent No. 5968809
; GENERAL INFORMATION:
;   APPLICANT: KNUTZON, DEBORAH
;   APPLICANT: MURKERJI, PRADIP
;   APPLICANT: HUANG, YUNG-SHENG
;   APPLICANT: THURMOND, JENNIFER
;   APPLICANT: CHAUDHARY, SUNITA
;   TITLE OF INVENTION: METHODS AND COMPOSITIONS FOR SYNTHESIS
;   TITLE OF INVENTION: OF LONG CHAIN POLY-UNSATURATED FATTY ACIDS IN PLANTS
;   NUMBER OF SEQUENCES: 18
;   CORRESPONDENCE ADDRESS:
;     ADDRESSEE: RAE-VENTER LAW GROUP, P.C.
;     STREET: 260 SHERIDAN AVENUE, P.O. BOX 60039
;     CITY: PALO ALTO
;     STATE: CA
;     COUNTRY: USA
;     ZIP: 94306
;   COMPUTER READABLE FORM:
```

Art Unit: 1638

; MEDIUM TYPE: Floppy disk
; COMPUTER: IBM PC compatible
; OPERATING SYSTEM: PC-DOS/MS-DOS
; SOFTWARE: PatentIn Release #1.0, Version #1.30
; CURRENT APPLICATION DATA:
; APPLICATION NUMBER: US/08/834,655
; FILING DATE: 11-APR-1997
; CLASSIFICATION: 435
; ATTORNEY/AGENT INFORMATION:
; NAME: RAE-VENTER, BARBARA
; REGISTRATION NUMBER: 32,750
; REFERENCE/DOCKET NUMBER: CGNE.124.00US
; TELECOMMUNICATION INFORMATION:
; TELEPHONE: (650) 328-4400
; TELEFAX: (650) 328-4477
; TELEX: N/A
; INFORMATION FOR SEQ ID NO: 2:
; SEQUENCE CHARACTERISTICS:
; LENGTH: 457 amino acids
; TYPE: amino acid
; STRANDEDNESS: not relevant
; TOPOLOGY: linear
; MOLECULE TYPE: peptide
US-08-834-655-2

Query Match 99.0%; Score 2441; DB 1; Length 457;
Best Local Similarity 98.7%;
Matches 451; Conservative 3; Mismatches 3; Indels 0; Gaps 0;

Qy 1 MAAAPSVRTFTTRAEILNAEALNEGGKKDAEAPFLMIIDNKVYDVREFVPDHPGGSVILTHV 60
|||||:|||||
Db 1 MAAAPSVRTFTTRAEVLNAEALNEGGKKDAEAPFLMIIDNKVYDVREFVPDHPGGSVILTHV 60

Qy 61 GKDGTDFVDTFHPEAAWETLANFYVGDI DESDRAIKNDFFAAEVRKLRTLFQSLGGYDSS 120
|||||:|||||
Db 61 GKDGTDFVDTFHPEAAWETLANFYVGDI DESDRDIKNDFFAAEVRKLRTLFQSLGGYDSS 120

Qy 121 KAYYAFKVSFNLCIWGLSTFIVAKWGQTSTLANVLSAALLGLFWQQCGWLAHDFLHHQVF 180
|||||:|||||
Db 121 KAYYAFKVSFNLCIWGLSTVIVAKWGQTSTLANVLSAALLGLFWQQCGWLAHDFLHHQVF 180

Qy 181 QDRFWGDLFGAFLGGVCQGFSSWWKDKHNTHHAAPNVHGEDPDIDTHPLLTWSEHALEM 240
|||||:|||||
Db 181 QDRFWGDLFGAFLGGVCQGFSSWWKDKHNTHHAAPNVHGEDPDIDTHPLLTWSEHALEM 240

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|||||:|||||
Db 301 SLVEQLSLAMHWTWYLATMFLFIKDPVNMLVYFLVSQAVCGNLLAIVFSLNHNGMPVISK 360

Qy 361 EEAVDMDFFTKQIITGRDVHPGLFANWFTGGLNYQIEHHLFPSMPRHNFSKIQPAVETLC 420
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Db 361 EEAVDMDFFTKQIITGRDVHPGLFANWFTGGLNYQIEHHLFPSMPRHNFSKIQPAVETLC 420

Qy 421 KKYGVRYHTTGMIEGTAEVFSRLNEVSKAASKMGKAQ 457
|||:|||||
Db 421 KKYNVRYHTTGMIEGTAEVFSRLNEVSKAASKMGKAQ 457

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Fatty acid elongase from from *Mortierella alpina* in U.S. Patent 6,677,145 is 96.8%

identical to SEQ ID NO: 3 of the instant application.

```

US-09-903-45631
; Sequence 31, Application US/09903456
; Patent No. 6677145
; GENERAL INFORMATION:
; APPLICANT: Abbott Laboratories
; APPLICANT: Mukerji, Pradip
; APPLICANT: Leonard, Amanda Eun-Yeong
; APPLICANT: Huang, Yung-Sheng
; APPLICANT: Pereira, Suzette L.
; TITLE OF INVENTION: ELONGASE GENES AND USES THEREOF
; FILE REFERENCE: 6407.US.P3
; CURRENT APPLICATION NUMBER: US/09/903,456
; CURRENT FILING DATE: 2001-07-11
; PRIOR APPLICATION NUMBER: US 09/624,670
; PRIOR FILING DATE: 2000-07-24
; PRIOR APPLICATION NUMBER: US 09/379,095
; PRIOR FILING DATE: 1999-08-23
; PRIOR APPLICATION NUMBER: US 09/145,828
; PRIOR FILING DATE: 1998-09-02
; NUMBER OF SEQ ID NOS: 116
; SOFTWARE: FastSEQ for Windows Version 4.0
; SEQ ID NO 31
; LENGTH: 318
; TYPE: PRT
; ORGANISM: Mortierella alpina
US-09-903-45631

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Query Match 96.8%; Score 1609; DB 2; Length 318;
Best Local Similarity 95.9%;
Matches 305; Conservative 6; Mismatches 7; Indels 0; Gaps 0;

Qy	1	MESIAQFLPSKMPQDLFIDLARAIGVQAAPYVDPLEAALVAQAEKFPTVVHHTRGFLVA	60
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Db	1	MESIAPFLPSKMPQDLFMDLATAIGVRAAPYVDPLEAALVAQAEKYIPTIVHHTRGFLVA	60
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Qy	121	MCGGILYEAYQANYGLFENAADHTVQGGLPMAKMIWLFYFSKIMEFVDTMIMVLKKNNRQI	180
		:	
Db	121	MCGGILYEAYQANYGLFENAADHTFKGLPMAKMIWLFYFSKIMEFVDTMIMVLKKNNRQI	180
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Db	181	SFLHVYHHSSIFTIWVLVTVPAPNGEAYFSAALNSFIHVIMYGYYFLSALGFKQVSFIKF	240
Qy	241	YITRSQMTQFCMMSIQSSWDAMYAMKVLGRPGYPFFITALLWFYMWMTMLGLFYNFYRKNAK	300
		:	
Db	241	YITRSQMTQFCMMSVQSSWDAMYAMKVLGRPGYPFFITALLWFYMWMTMLGLFYNFYRKNAK	300
Qy	301	LAKQAKIDAAKEKARKLQ	318
Db	301	LAKQAKADAKEKARKLQ	318

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$\Delta 5$ desaturase from *Mortierella alpina* in U.S. Patent No. 6,913,916 is 97.1% identical to SEQ ID NO: 5 of the instant application.

```

US-09-624-670 29
; Sequence 29, Application US/09624670
; Patent No. 6913916
; GENERAL INFORMATION:
; APPLICANT: Abbott Laboratories
; APPLICANT: Mukerji, Pradip
; APPLICANT: Das, Tapas
; APPLICANT: Huang, Yung-Sheng
; APPLICANT: Parker-Barnes, Jennifer M.
; APPLICANT: Leonard, Amanda Eun-Yeong
; APPLICANT: Thurmond, Jennifer M.
; TITLE OF INVENTION: ELONGASE GENES AND USES THEREOF
; FILE REFERENCE: 6407.US.P2
; CURRENT APPLICATION NUMBER: US/09/624,670
; CURRENT FILING DATE: 2000-07-24
; PRIOR APPLICATION NUMBER: US 09/379,095
; PRIOR FILING DATE: 1999-08-23
; PRIOR APPLICATION NUMBER: US 09/145,828
; PRIOR FILING DATE: 1998-09-02
; NUMBER OF SEQ ID NOS: 87
; SOFTWARE: FastSEQ for Windows Version 4.0
; SEQ ID NO 29
; LENGTH: 446
; TYPE: PRT
; ORGANISM: Mortierella alpina
US-09-624-670-29

```

Query Match 97.1%; Score 2344; DB 2; Length 446;
Best Local Similarity 96.6%;
Matches 431; Conservative 6; Mismatches 9; Indels 0; Gaps 0;

Qy	1	MGTDQGGKFTFTWQELAAHNTEDSLALLAIRGNVYDVTKFLSRHPGGTDTLLLGAGRDVTPVF	60
		: :	
Db	1	MGTDQGGKFTFTWEEELAAHNTKDDLLLAIRGRVYDVTKFLSRHPGGVDTLGLGAGRDVTPVF	60
Qy	61	EMYHEFGAAEAIMKKYYVGTLVSNELPIFPEPTVFHKTIKGRVEAYFKDRNMDSKNRPEI	120
		: :	
Db	61	EMYHAFGAADAIMKKYYVGTLVSNELPIFPEPTVFHKTIKTRVEGYFTDRNIDPKNRPEI	120
Qy	121	WGRYALIFGSLIASYYAQLFVPFVVERTWLQVVFPAIIMGFACAQVGLNPLHDASHFSVTH	180
Db	121	WGRYALIFGSLIASYYAQLFVPFVVERTWLQVVFPAIIMGFACAQVGLNPLHDASHFSVTH	180
Qy	181	NPTVWKILGATHDFENGASYLVWVYQHMLGHHPTYTNIAGADPDVSTSEPDVRRIKPNQKW	240
Db	181	NPTVWKILGATHDFENGASYLVWVYQHMLGHHPTYTNIAGADPDVSTSEPDVRRIKPNQKW	240
Qy	241	FVNHNINQHMFVPFLYGLLAFKVRIQDINILYFVKTNDAIRVNPISTWHTVMFWGGKAFFV	300
Db	241	FVNHNINQHMFVPFLYGLLAFKVRIQDINILYFVKTNDAIRVNPISTWHTVMFWGGKAFFV	300
Qy	301	WYRLIVPMQYLPLSKVLLLFTVADMVSSYWLALTFQANHVVVEEQWPLPDENGIIQKDKWA	360
		:	
Db	301	WYRLIVPLQYLPLGKVLLLFTVADMVSSYWLALTFQANHVVVEEQWPLPDENGIIQKDKWA	360
Qy	361	AMQVETTQDYAHDShLWTSITGSLNYQAVHHLFPNVSQHHYPDILAIKNTCSEYKVPYL	420
		:	
Db	361	AMQVETTQDYAHDShLWTSITGSLNYQAVHHLFPNVSQHHYPDILAIKNTCSEYKVPYL	420
Qy	421	VKDTFWQAFASHLEHLRVLGLRPKEE	446

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Db 421 VKDTFWQAFASHLEHLRVLGRLPKEE 446

Allowable Subject Matter

Nucleic acid sequences encoding the proteins comprising the amino acid sequences of SEQ ID NOS: 1, 3 and 5, are free of the prior art.

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eileen B. O'Hara whose telephone number is (571) 272-0878.

The examiner can normally be reached on 9:00-5:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571) 272-0975.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Eileen B. O'Hara/
Primary Examiner
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